

GEORGE J. HOCHBRUECKNER & ASSOCIATES, INC.

— NEW YORK OFFICE —

PRIVATE ROAD, EDGEMERE PARK

P.O. BOX 637

LAUREL, NY 11948

ORIGINAL

TEL (631) 298-1298

FAX (631) 298-1260

March 10, 2000

TO: U.S. Department of Transportation Dockets
Docket No. FAA-1999-6411-18
400 Seventh Street, SW., Room Plaza 401
Washington D.C. 20590

FROM: George J. Hochbrueckner
Member of Congress (1987-95)

RE: **Transport Airplane Fuel Tank System Design review
Flammability Reduction, and Maintenance and
Inspection Requirements.**

REPT OF TTD OPERATION
COMM. 314-02

As a frequent airline traveller, I applaud the FAA effort to improve aircraft safety by promulgating rules to eliminate ignition sources within airplane fuel tanks. I wish you well in achieving this worthy goal.

However, as the only engineer who served on the House Armed Services Committee from 1987 to 1995, I suggest that while your rule making effort can have the effect of reducing the number of ignition incidents, ignition episodes will still occur, as long as there are wires carrying electricity in the fuel tanks.

Clearly, the main goal of your rule making effort is to prevent fuel tank explosions, such as occurred in TWA Flight 800. Certainly, your rule making effort is important because eliminating fires in aircraft fuel tanks is a key safety issue. However, the action that will absolutely prevent fuel tank explosions is to fill the fuel tank with an expanded aluminum mesh.

Explosions in gas tanks, or any tanks containing a flammable substance, are caused by a sudden increase in heat and pressure. This sudden increase in heat and resultant pressure can be reduced below the explosive threshold by filling the tank with a thin mesh made of an expanded aluminum alloy. The aluminum mesh product works to reduce combustion overpressure by absorbing the heat generated following ignition and by conveying the heat generated by combustion away from the source of ignition, and thereby prevents explosions. Fuel tanks and other vessels containing flammable liquids filled with the mesh will not explode when exposed to sparks, electrostatic charges or

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projectiles entering the fuel tank. The mesh also has the advantage of stabilizing the tank's contents, reducing evaporative emissions up to 60%, while taking up only 1.5% of the tank's volume.

The aluminum mesh technology is currently employed by a number of military organizations in Europe and Asia, as well as civil law enforcement and various industries. It is currently being manufactured in the U.S. and is available in quantity for testing and installation in airplanes and ground vehicles.

The U.S. Department of Defense is presently conducting live-fire tests on the aluminum mesh tank liner at Wright-Patterson Air Force base and the tests to date have been successful. Aluminum mesh is more cost-effective than current explosion suppression systems. It lasts the lifetime of the fuel tank and never requires replacement.

The Congress has already shown its support for this program in FY 1999 and FY 2000. In FY 1999, \$1 million was provided to the Air Force to initiate the program in C-130 aircraft. In FY 2000, the Reserve and Guard were given a substantial increase in funding and Congress provided "priority consideration" for the installation of aluminum mesh tank liners for C-130 aircraft and Army ground vehicles.

I suggest that the FAA in a separate action from this rule making effort should consult with the Deputy Director, Live Fire Testing in the Pentagon (Jim O'Bryon 703 614-5408) and then take the explosion prevention action of outfitting all aircraft under the FAA jurisdiction. The good news is that the aluminum mesh product is inexpensive. The estimated product cost to outfit the center tank of a 747 is \$50,000. This would be a one time cost since the product would last the life of the tank.

Good Luck with your rule making effort, but recognize that whatever requirements the FAA imposes on aircraft manufacturers and users, Murphy's Law will ultimately prevail; ignitions in fuel tanks will occur. Please don't allow those ignitions to result in fuel tank explosions.

There is a real solution to preventing explosions in fuel tanks and I hope for the safety of the flying public the FM will recognize it and impose it.